ATTACHMENT B
Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (currently amended) A confocal endoscope or microscope ~~including~~ for imaging a sample, comprising:

a light source of coherent light for illuminating ~~a~~ the sample;

a beam splitter for deviating the path of a beam of light by an amount dependent on one or more beam parameters selected from the group consisting of polarization and wavelength;

a light condenser located optically between said beam splitter and said sample; and

light receiving means for receiving returned coherent light from said light source and for forming an image of the sample therefrom, (1) wherein an incident beam of coherent light from said light source is directed onto said beam splitter and hence onto said light condenser, then focused onto said sample by said light condenser as coherent light, and (2) wherein light returning from said sample and incident on said beam splitter is deviated by said beam splitter by an angle to said incident beam that is small relative to 90° and is then received by said light receiving means, said light receiving means located to receive said returning light and near said light source.

2. (original) A confocal endoscope or microscope as claimed in claim 1, including an optical head and said light source is located in or on said head.

3. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 2, including heating means for maintaining said head at a temperature substantially equal to that of said sample.

4. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 1, wherein said light source and said light receiving means are on a single mounting means.

5. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 4, wherein said beam splitter is mounted on said mounting means.

6. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 4, wherein said mounting means is moveable for scanning said light source.

7. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 4, wherein said mounting means includes a reed.

8. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 4, wherein said mounting means is an electromagnetically vibrated reed.

9. (original) A confocal endoscope or microscope as claimed in claim 1, wherein said light source and said light receiving means are adjacent or touching.

10. (previously presented) A confocal endoscope or microscope as claimed in claim 1, wherein said light source is an optical fiber tip.

11. (previously presented) A confocal endoscope or microscope as claimed in claim 1, wherein said beam splitter includes a plurality of optical elements selected from prisms, lenses, or both prisms and lenses.

12. (previously presented) A confocal endoscope or microscope as claimed in claim 11, wherein said incident beam of coherent light and said returning light from said sample are parallel in a region between said beam splitter and said light condenser, and wherein said plurality of optical elements provide net deviation or translation, so that said coherent light and said light returning from said sample respectively emerge from

said plurality of optical elements substantially parallel to and optically coaxial with its respective path immediately before impinging said plurality of optical elements.

13. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 11, wherein said plurality of optical elements is arranged to focus confocal return stokes fluorescence to form a line, said line forming a spectrum in which shorter wavelength fluorescence is located towards a first end of said line closer to said light source, while longer wavelength fluorescence is located towards a second end further from said light source.

14. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 1, including means to allow light on either side of a spectral line in said returning light to be included with light from said spectral line when said returning light impinges on said light receiving means.

15. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 14, wherein said means is controlled by a mechanism which occludes light which is more distant in wavelength than a desired amount from said spectral line, to allow control of depth of field isolation.

16. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 14, including optical elements to divert chosen wavelength portions of said spectral line to one or more photodetectors to give different spectral channels for imaging.

17. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 1, including at least one optical waveguide channel to convey said returning light to said photodetectors.

18. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 1, including a laser and an optical waveguide to convey light from said laser to said light source.

19. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 1, including a first optic waveguide to convey light to said specimen and at least one second optic waveguide channel to convey said returning light to said photodetectors, and said beam splitter is disposed in said head between said first and second optic waveguides.

20. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 1, including a return fiber and wherein said beam splitter is located between a light exit area of said return fiber and said photodetectors, to provide spectral separation after said returning light exits said fiber.

21. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 1, including an aperture slit moveable in front of said photodetectors simultaneously with said scanning to compensate for changes in beam splitter deviation.

22. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 11, wherein said plurality of prisms and/or lenses include at least one apochromatic lens.

23. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 11, wherein said prisms and/or lenses include an SF 11 or SF 59 prism.

24. (previously presented) A method for performing confocal endoscopy or microscopy including the steps of:

illuminating a sample by transmitting an incident or excitatory beam of coherent light through a beam splitter and then onto a light condenser that focuses said coherent light so as to impinge upon said sample as coherent light; deviating light returning from

said sample by an angle to said incident beam that is small relative to 90° by said beam splitter; and

receiving or detecting said returning light at a point close to a source of said incident or excitatory beam;

wherein said beam splitter deviates the path of the light returning from said sample by an amount dependent on one or more beam parameters selected from the group consisting of polarization and wavelength.

25-41. (canceled)

42. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 1, wherein said light source comprises a mirror located in the path of the returning light for directing light towards said sample, wherein said mirror has a smaller solid angle than said returning light to only partially occlude reception of said returning light by said light receiving means.

43. (withdrawn - original) A confocal endoscope or microscope as claimed in claim 42, wherein said mirror and said light source are provided on a single piece of silicon and said mirror comprises an etched mirror surface of the silicon.

44. (previously presented) A method for performing confocal endoscopy or microscopy including the steps of:

illuminating a sample by transmitting an incident or excitatory beam of coherent light, including focusing said incident or excitatory beam by means of a light condenser so as to impinge upon said sample as coherent light;

passing at least some light returning from said sample through said light condenser to form a beam of returning light, said beam of returning light being is broader than said incident or excitatory beam whereby a portion of said beam of returning light avoids retracing the path of said incident or excitatory beam; and

detecting at least some of said portion of said beam of returning light.

45. (withdrawn - original) A method as claimed in claim 44, including directing said incident light towards said sample by means of a mirror located in the path of said returning light, wherein said mirror has a smaller solid angle than said returning light to only partially occlude reception of said returning light.

46. (withdrawn - original) A method as claimed in claim 45, wherein said mirror and the source of said incident light are provided on a single piece of silicon and said mirror comprises an etched mirror surface of the silicon.

47. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 16, wherein the optical elements also divert light close in wavelength to said spectral line.

48. (withdrawn - previously presented) A confocal endoscope or microscope including:

a light source of coherent light for illuminating a sample;

a beam splitter;

a light condenser located optically between said beam splitter and said sample; and

light receiving means for receiving returned coherent light from said light source, (1) wherein an incident beam of coherent light from said light source is directed onto said beam splitter and hence onto said light condenser, then focused onto said sample by said light condenser as coherent light, and (2) wherein light returning from said sample and incident on said beam splitter is deviated by said beam splitter by an angle to said incident beam that is small relative to 90° and is then received by said light receiving means, said light receiving means located to receive said returning light and near said light source; and

wherein said beam splitter includes polarization rotating means and deviation means to separate light of different polarizations, and operates by optically rotating said coherent light and said returning light.

49. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 48, wherein said polarization rotating means is based on optical rotary dispersion and includes a chiral medium to optically rotate said coherent light and said returning light.

50. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 48, wherein said polarization rotation means includes a Faraday effect material, said material having simultaneously magnetic lines of force in the same direction as the propagation direction of said light, whereby the E vector of said coherent light is rotated as it passes through said material .

51. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 48, wherein said polarization rotation means includes phase plates or retardation elements, of a material whose structure is anisotropic at a molecular or crystalline level.

52. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 48, wherein said polarization rotation means includes liquid crystals.

53. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 52, wherein said liquid crystals are optically active and/or birefringent.

54. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 52, wherein said liquid crystals are cholesteric liquid crystals.

55. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 48, wherein said optical rotation is provided by intrinsic polarization properties of the sample or of any intermediate optical medium.

56. (withdrawn – previously presented) A method for maintaining registration in a confocal endoscope or microscope including a coherent light source, a light condenser

located optically between an angle deviation beam splitter and a sample, and a light receiving means, including the steps of:

splitting light returned from the sample with the angle deviation beam splitter whose angle of deviation is small relative to 90°;

employing said coherent light source and said light receiving means located on a single moveable mounting means; and

moving said mounting means to scan said coherent light source and thereby to scan said sample with coherent light focused on the sample with the light condenser;

wherein said beam splitter deviates the path of the light returned from said sample by an amount dependent on one or more beam parameters selected from the group consisting of polarization and wavelength.

57. (withdrawn - previously presented) A method as claimed in claim 56, wherein said beam splitter includes a plurality of optical elements selected from prisms, lenses, or both prisms and lenses.

58. (withdrawn - previously presented) A method as claimed in claim 57, wherein said plurality of prisms and/or lenses provide a net deviation which is minimal.

59. (withdrawn - previously presented) A method as claimed in claim 57, including moving said beam splitter with said light source and said light receiving means.

60. (withdrawn - previously presented) A method as claimed in claim 56, wherein said moving of said mounting means comprises vibrating said mounting means.

61. (withdrawn - previously presented) A method as claimed in claim 56, wherein said mounting means is a reed.

62. (withdrawn - previously presented) A method as claimed in claim 56, wherein said mounting means is an electromagnetically vibrated reed.

63. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 1, wherein said beam splitter includes polarization rotating means so that said beam splitter rotates the polarization axis of said returning light then diverts the path of said returning light.

64. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 63, wherein said polarization rotating means operates by means of optical rotary dispersion and includes a chiral medium to optically rotate said coherent light and said returning light.

65. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 63, wherein said polarization rotating means includes a Faraday effect material, said material having simultaneously magnetic lines of force in the same direction as the propagation direction of said light, whereby the E vector of said coherent light is rotated as it passes through said material .

66. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 63, wherein said polarization rotating means includes phase plates or retardation elements, of a material whose structure is anisotropic at a molecular or crystalline level.

67. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 63, wherein said polarization rotating means includes liquid crystals.

68. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 67, wherein said liquid crystals are optically active and/or birefringent.

69. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 67, wherein said liquid crystals are cholesteric liquid crystals.

70. (withdrawn - previously presented) A confocal endoscope or microscope as claimed in claim 1, wherein said optical rotation is provided by intrinsic polarization properties of the sample or of any intermediate optical medium.